

A Proposal to Develop

**An Integrated Assessment Approach for
Siting Wind Turbines in Coastal Counties in Michigan**

Draft Date 5/27/2008 11:24 AM to be submitted:

Submitted to

Michigan Sea Grant on May 30, 2008

Principal Investigator

Dr. Soji Adelaja
John A. Hannah Distinguished Professor in Land Policy
Director, The Land Policy Institute (LPI)
Michigan State University
(517) 432-8800
Fax: (517) 432-8769
310 Manly Miles Building
1405 S. Harrison Road
East Lansing, MI 48823
Adelaja@landpolicy.msu.edu

Additional Team Members

Dr. Yohannes Hailu, Associate Director for the Hannah Professor Research Program, LPI, MSU
(517)432-8800 ext. 112 yhailu@landpolicy.msu.edu
Mary Ann Heidemann, Regional Land Use Educator, MSU
(989) 354-9870 heidemannma@alpenacounty.org
John Hummer, Project Manager, Great Lakes Commission
(734)971-9135 jhummer@glc.org
Charles McKeown, Informatics Manager, LPI, MSU
(517)432-8800 ext. 106 mckeownc@landpolicy.msu.edu
Victoria Pebbles, Program Manager, Great Lakes Commission
(734)971-9135 vpebbles@glc.org
Kurt H. Schindler, Regional Land Use Educator, MSU
(231) 779-9480 schindl9@msu.edu
Dr. John Warbach, Associate Director, LPI, MSU
(517)432-8800 ext. 107 Warbach@landpolicy.msu.edu

NON-TECHNICAL SUMMARY/ABSTRACT (200 words max – cut by 130)

The proposed project is to perform an integrated assessment to assist Michigan coastal communities with navigating the issue of siting of wind turbines by performing an integrated assessment in select coastal regions. The purpose of the integrated assessment is to develop a set of highly relevant policy options and forecasted implications if adopted that could be used statewide to assist coastal regions around the state in wind turbine siting decision making.

Michigan has been recognized as a state with strong wind energy development potential, and windy, coastal communities will face pressure to develop wind farms. It will face even greater pressure when a renewable portfolio standard and perhaps other related legislation passes. Our proposal will help community leaders in the windiest regions understand what the costs and benefits of wind energy development may be for their communities, and provide them with a suite of policy options that address the natural, cultural and visual resources, economic and tax benefits and costs, tourism, wind turbine structure factors, transmission facilities, land use regulation among other factors that emerge in the process.

Five regions distributed around the state with a variety of physical and social considerations, have been selected for the study. These regions of the state have been determined by LPI (based on the “Wind Prospecting Tool Prototype”) to be favorable for siting wind turbines based on wind, land use, land values, development pressure, local regulation and other factors. This means that the regions have significant potentially suitable lands.

To assist local decision makers, the project will develop diverse wind energy groups in each of five pilot regions to work collaboratively to identify local issues and values to inform the Integrated Assessment process, and to build local capacity to deal with wind siting issues in communities in each region.

PEER REVIEWERS

1. Jeff Anthony, Manager of Utility Programs & Policy American Wind Association
(414)967-5950 janthony@asea.org
(insert mailing address – requested Fri 5/23 from John H.)
2. David Matthiesen, Ph.D. Associate Professor, Dept of Materials Science & Engineering
Great Lakes Institute for Energy Innovation Case School of Engineering, Case Western Reserve University
10900 Euclid Avenue; Cleveland, OH 44106
(216)368-1366 david.matthiesen@case.edu
3. Stefan Schmidt, Squire Sanders
Tower 42, 25th Floor; 25 Old Broad Street; London, EC2N 1HQ, United Kingdom
44.20.7189.8000 sschmitz@ssd.com

OBJECTIVES

The overall goal of the project is to identify the benefits, consequences, and optimum approaches for locating wind energy generating facilities in Michigan coastal communities. The team proposes to assist communities in coastal areas with assessing the multiple factors that affect the placement of wind energy generating facilities so that communities may use the tool for developing policy and making decisions about such facilities. The objectives of the project are to:

- 1) Increase general knowledge among residents and decision-makers about state energy and wind development issues and how they may affect their coastal communities;
- 2) Increase stewardship of local resources which are under real or perceived risk when local wind development occurs;
- 3) Identify inconsistencies between state policies and regulations and local ordinances;
- 4) Demonstrate to decision makers and the public the full costs and benefits of energy choices; and
- 5) Identify sample local ordinance and state statutory language for consideration by decision makers.

INTEGRATED ASSESSMENT METHODS

Problem/Issue Statement

The state of Michigan is promoting the development of renewable and alternative energies. Wind energy development is of growing interest to many private and public sectors. However some communities have limited capacity to address the potential challenges associated with locating wind energy generating facilities in the Great Lakes coastal zone and therefore are not well prepared to manage the use of the Great Lakes coastal zone for this activity. The Department of Energy's Wind Program and the National Renewable Energy Laboratory published a wind resource map for the state of Michigan that identifies wind resource potential the vast majority of the nearshore (both land and water) area (at 50 meters in height). Interest in developing this potentially valuable renewable energy source is increasing across the state. It is challenging to manage multiple uses of the same resource, especially if they are competing and/or potentially conflicting uses. For example, the area of highest value for nearshore (land and water) wind energy development is also important fish, bird and wildlife habitat as well as having considerable aesthetic value important to the tourism industry. An assessment that examines causes, consequences and approaches to minimizing the impacts of locating wind energy generating facilities in a specific Michigan location, on or off-shore would be a valuable addition to a pro-active policy for the state of Michigan.

Background

Efforts to locate wind energy generating facilities involve a variety of interests including land owners who could realize lease income, neighbors who will experience a change in the landscape, the major and independent power companies, visitors to the community who either come to see the wind turbines or express concern about view changes, local officials with the responsibility to plan for and regulate growth of the community, groups that believe wind energy generating facilities affect an aspect of the world with which they are concerned, and other citizens. The areas most affected by efforts to locate wind energy generating facilities

have been coastal counties. The objective of this project is to develop an integrated assessment tool for planners and other officials in coastal communities to make informed decisions weighing the benefits and impacts of locating wind energy facilities in their communities and assist members of those communities with using the tool.

Solution Space

While the Michigan Governor's 21st Century Electric Energy Plan calls for renewable energy to play a significant future role, Michigan has no effective policy at the state level, such as a renewable portfolio standard, or feed-in tariffs in place to foster it. In addition, state regulating agencies have few rules in place that apply specifically to wind energy generating facilities. Some communities in Michigan have adopted zoning ordinances that deal with wind turbines, but these are inconsistent; many require studies that the reviewers have no expertise to evaluate, many are structured not to mitigate concerns, but to preclude building wind turbines, and many more communities have no applicable local regulations. In this policy void, speculators and utilities are leasing land for wind energy generating facilities; transmission companies are estimating where they will need increased capacity to carry the power, while most renewable energy economic development is currently bypassing Michigan in favor of states with progressive and cohesive renewable energy policies.

Draft 1A Questions: What are the benefits, consequences and optimum approaches for locating wind energy generating facilities in Michigan coastal communities?

Agency Contact: Cathy Cunningham Ballard, DEQ, (517)335-3456, Cunninggc@michigan.gov

Project Approach

The Land Policy Institute (LPI)/Great Lakes Commission (GLC) Team (Team) proposes to assist communities in coastal areas with assessing the multiple factors (wind availability, environment, view, economic development, property rights, transmission connection, safety, property taxes and others) that affect the placement of wind energy generating facilities. Communities can then use the tool in making decisions about such facilities. An integrated assessment approach will guide this project, and coastal communities throughout Michigan will be provided guidance in developing local policy alternatives and forecasting the outcomes among a variety of variables with individualized regional priority. Throughout the project, team members and collaborators will provide assistance to collaborative regional integrated assessment teams. The IA team proposes the following steps of the integrated assessment:

INTEGRATED ASSESSMENT STEP I: Document the Status and Trends of Environmental, Social, and Economic Conditions Related to the Benefits, Consequences, and Optimum Approaches for Locating Wind Energy Generating Facilities in Coastal Areas

Develop a scientific tool with multiple considerations to identify good areas for wind turbine siting from a development standpoint. Design a method for combining local social values and interests with the Land Policy Institute Wind Prospecting Tool. Develop survey instrument and questions. Conduct focus groups in 5 communities with diverse interests. Focus groups may include farmers, other landowners (forest lands, brownfields, homeowners, etc), local officials,

local industry, environmental, (ornithology, dune protection, etc) groups, and tourism. Collect local social values data from focus groups of special interests. Update LPI's database of existing local wind ordinances.

Identify Coastal Community Interests and Concerns To gather the information the Team will hold facilitated discussions with a broad representation of coastal community and wind industry interests in five coastal areas introduced below. General areas have been selected based on their potential for wind development (as determined by the Land Policy Institute Wind Prospecting Tool which is based on the 50 meter wind maps and other criteria), and geographical distribution. Locales with diverse local issues and a range of concerns were selected so that the project may develop a comprehensive suite of policy alternatives that could be transferable to most coastal communities. The areas of the state that have been selected for conducting an integrated assessment include:

1. **Grand Traverse County, Peninsula Area.** This area has excellent wind resources and a mix of land uses. This area thrives on its natural beauty and has leveraged it into a growing local economy. Local feeling about wind energy's impacts run the gamut from a desire for sustainable, clean energy to a deep rooted concern about preserving the viewshed, noise, and safety concerns. This region will be an excellent area to explore all these factors.
2. **Presque Isle County, Rogers City Area.** This area has good wind resource and in contrast to number one has a slower economy and less near term potential for growth. It also has proposed local coal fired electrical generation. It has good grid connectivity making it a good locale for wind. This region captures the concerns of lower economic performance, possible brownfield redevelopment and concerns of coastal developers.
3. **Bay County, Essexville Area.** This area is predominantly grain agriculture, the wind resource is excellent and as projects in neighboring areas get underway the area is generally amenable to wind development as an economic tool.
4. **Keweenaw, Houghton, Marquette and Baraga Area.** Excellent wind resource in a predominately forested coastal setting. Good perspective on the Upper Peninsulas rural and urban issues.
5. **Mason County, Ludington Area.** Western Lower Peninsula site with good wind and very diverse land use and economic development concerns ranging from agriculture to tourism. In addition this is the site of Michigan's only pump storage facility and is also adjacent to good shallow offshore resources.

Information will be gathered about interest and motivations for wind energy development, level of knowledge or understanding about the issues surrounding intermittent wind, full costs and benefits of wind energy, environmental impacts, aesthetic preferences. Local officials who have been developing local ordinances have addressed tower height, tower setback, avoiding a climbing hazard, noise levels, shadow flicker, decommissioning, overhead or underground wires, state law and county law (Klepinger "Wind Power in Michigan Land Use and Policy Issues"). We will assist communities with navigating these and other concerns that are raised.

This phase will build on the team's experience and knowledge about the local, regional and state challenges of locating wind energy generating facilities in coastal communities and provide critical information about local concerns.

Social data entry and analysis of results.

INTEGRATED ASSESSMENT STEP II: Describe the Environmental, Social, and Economic Causes and Consequences of the Conditions and Trends

By means of iterative, stakeholder involvement process the Team will learn what information communities need to make wind development decisions. The development of wind resources in communities can be affected, among other things, by: availability of large parcels of agricultural or forest lands; the value of land in agriculture, forestry and related economic uses; existing development pressure in communities determining the value of land resources; natural features affecting wind development costs and generated capacity; sensitive lands and threatened and endangered species habitat constraining areas of potential development; availability of accessible and cost-effective transmission interconnection; local planning and zoning affecting local land uses; view assessment; wildlife interactions assessment; and other community specific considerations. This multi-dimensional consideration of factors in supporting local decision making on wind development balances wind development goals with other relevant considerations of communities.

Economic Impact of Wind Development

One relevant factor in determining the optimal level of wind development in communities is consideration of the potential economic impacts of different scale turbine generating facilities. Based on the potential wind capacity of communities and developable wind capacity identified in the first step through the Integrated Wind Assessment Tool, the economic impact of a chosen level of wind development can be estimated. The Tool determines the potential developable capacity, but the actual development of wind depends on the actions of multiple players. A scenario analysis on the economic impact associated with 15%, 30%, 45%, 60%, 75% and full capacity wind development will be estimated. The economic impact analysis will be based on the JEDI economic impact assessment software developed by the Department of Energy that relates per MegaWatt wind energy development with potential investment, employment, wage, and land lease payments. This information, based on the scenario analysis, will assist communities in understanding the relationship between the level of wind energy development and associated economic impacts.

Tax Impact Assessment

A potential benefit to local communities from wind energy development is the flow of tax income from wind energy generating facilities and properties. The local tax benefit will depend on the tax rate assessment on properties. In the absence of a state-defined property tax law governing wind energy related properties, a scenario based analysis on the local tax income implications from wind energy properties, under different property tax rates, will be conducted. The tax impact assessment will also depend on a scenario of the level of wind energy

development and the estimated requisite wind energy related properties needed (mostly land and wind turbines). The tax impact analysis will additionally provide information to local communities to help them determine their policy choices related to wind energy development.

INTEGRATED ASSESSMENT STEP III: Provide Forecasts of Conditions Under Various Policy Options

Provide alternative, creative ordinances as samples. With community input, develop policy options for each region and forecast outcomes regarding areas of concern or interest among the policy options.

INTEGRATED ASSESSMENT STEP IV: Develop Guidance for Implementing Each Option Making Explicit the Uncertainty Associated with Forecasts

Assist Coastal Counties with the Integrated Assessment of Wind Energy Facility Placement: The Team will provide regional training opportunities for local community officials, citizen interest groups, the wind industry, members of the State Wind Outreach Team, such as LPI, MSU Extension, Great Lakes Commission, Great Lakes Renewable Energy Association, NextEnergy, Michigan Public Services Commission, DEQ Energy Office, Michigan Economic Development Corporation, universities and others and others in how to utilize the wind impact assessment tool. This training will enable members of the MSU Extension, SWOT and others as available, to provide decision support to communities in the development of local policy, regulation and economic development opportunities based on sound science.

State/Regional Outreach: Further, the Web-based Integrated Assessment can serve as the model framework for dissemination via the Great Lakes Information Network as well as posted on the web site of the Great Lakes Wind Collaborative—a multi-stakeholder, bi-national group established “to build consensus and identify and address issues affecting the planning, development, and operation of wind power facilities in the Great Lakes region.” The group provides a forum for dialogue and an opportunity for analysis and exchange of information among key stakeholders to facilitate sustainable wind power development in the region. The GLC provides staff and secretariat support for Great Lakes Wind Collaborative.

STAKEHOLDER PROCESS. The following is the process by which the Team will engage stakeholders in each region:

1. Identify an objective, skilled coordinator/facilitator to assemble collaborative stakeholder groups in each region and guide the assembly of each regional collaborative IA Team. Assemble a list of stakeholder organizations and project contacts. Statewide organizations such as Michigan Land Use Institute, Audubon, Michigan Sustainable Energy Coalition, MAP and the public utilities will also be invited to serve on regional stakeholder groups.

2. IA Team will provide an overview of energy policy issues and a brief training session on wind energy siting issues. It will then conduct focus groups with diverse representation for gathering information about special interests and concerns.
3. Report back to the collaborative group and present results to decision makers and gather suggestions for policy making. The Team will ground truth the impact assessment through a second set of facilitated public meetings in the 5 communities to guide the communities through the assessment process and learn how it should be refined for usability, completeness, accuracy and the degree to which communities find it a fair and objective tool to support sound decision making at the local level.
4. Present policy and implementation alternatives to local officials and to stakeholder groups.

PROJECT TIMELINE

Quarter	Project Activity	Responsible Team Member
1, 2 & 3	Document status and trends of environmental, social and economic conditions. <ul style="list-style-type: none"> - Identify regional coordinators. - Assemble collaborative regional workgroups. - Conduct focus groups. - Develop and present compilation of conditions. 	Adelaja, Warbach, McKeown, Pebbles, Hummer, MSU Extension, Hailu
4 & 5	Describe causes and consequences. <ul style="list-style-type: none"> - Present status and trends and collect information from regional IA workgroups. - Research causes and consequences. 	McKeown, Warbach, Adelaja, MSU Extension, Hailu
6	Forecast conditions under various policy options. Ground truth the impact assessment.	Pebbles, Hummer, Warbach, MSU Extension, Hailu
7 & 8	Develop guidance for implementing each option making uncertainties explicit. <ul style="list-style-type: none"> - Assist coastal counties with integrated assessment of wind energy facility placement. - State/regional outreach. 	Adelaja, Pebbles, Hummer, Warbach, and SWOT Team, MSU Extension, Hailu

Comment [MD1]: This column has yet to be edited. Please make suggestions.

Project Team and Collaborators

Name	Institution	Team Member or Collaborator	Contact Status	Role and Responsibilities
Dr. Soji Adelaja	Land Policy Institute (LPI) Michigan State University	PI	Agreed	PI, Team Leader, Collaborates to determine research and outreach methods, economist, policy advisor
Dr. John D.	Land Policy	Team Member	Agreed	Day-to-day research

Comment [MD2]: This section needs to be transformed into narrative describing each team member's skills and contributions.

Warbach	Institute			coordinator, outreach
Charles McKeown	Land Policy Institute	Team Member	Agreed	Data acquisition and analysis and GIS mapping
Victoria Pebbles	Great Lakes Commission	Team Member	Agreed	State level policy analysis and communications; public meeting facilitation, outreach and education
John Hummer	Great Lakes Commission	Team Member	Agreed	Public meeting facilitation, outreach and education; liaison with Great Lakes Wind Collaborative
State Wind Outreach Team	MSU Extension and Land Use Educators, Great Lakes Commission, Great Lakes Renewable Energy Association, MEDC, Michigan Public Services Commission, DEQ, Others	Collaborators	Need to Contact (all are ongoing partners of GLC and LPI)	Public meeting facilitation, outreach, education and convening
Yohannes Hailu, Ph.D.	Land Policy Institute	Collaborator	Agreed	Integrated assessment tool contributor

The core of the Land Policy Institute's (LPI) mission is to resource policy makers at the federal, state, and local level with science-based tools and solutions that help build a better quality of life, strengthen the economy, and protect the environment in ways that are fair to all. Recognizing that land use policies are pivotal to the state's success, we engage scientists from MSU, other universities in Michigan, and universities outside Michigan to develop strategies and policy tools to position Michigan for the future based on the principles of strategic growth. In everything we do, we consider economic, social, and environmental issues.

The Land Policy Institute has provided leadership in developing publications and tools on wind industry development including: Michigan's 2015 Renewable Portfolio, Standard (RPS): *Wind Turbines Required and Projected Land Usage; Projected Impacts of Renewable Portfolio Standards on Wind Industry Development in Michigan* - White Paper Prepared for the Office of

the Governor - State of Michigan; Hosted 2007 "Manufacturing and Developing Wind Energy in Michigan" Symposium; LPI and MSU Extension published bulletin entitled *Michigan Land Use Guidelines for Siting Wind Energy Systems 2007*; and LPI and MSU Extension published bulletin entitled *Best Practices for Wind Power: Planning and Zoning 2006/2007*.

The Great Lakes Commission is a public agency established by the Great Lakes Basin Compact in 1955 to help its member states and provinces speak with a unified voice and collectively fulfill their vision for a healthy, vibrant Great Lakes - St. Lawrence River region. Commission programs provide leadership in the areas of communication and education, information integration and reporting, facilitation and consensus building, and policy coordination and advocacy. The Commission is a leader in regional coordination and policy analysis. The Commission educates and empowers government, citizens and other stakeholders to effectively participate in decisions affecting the future of the region. The Commission also informs and advises state/provincial decision makers about Great Lakes issues on a regional, binational and international scale.

The Great Lakes Commission provides leadership and coordination of the Great Lakes Wind Collaborative. Through the Great Lakes Information Network they provide information about wind energy to the entire region.

Data and Data Sets

The LPI/GLC team will employ existing data sets including:

- The National Renewable Energy Laboratory 50 meter wind density GIS layer, the NREL 70m and 90m wind speed GIS layers.
- The U.S. Census bureau spatial and tabular demographic and housing data.
- The Michigan State Tax Commission property value database.
- The National Agriculture Statistics Service Michigan Cropland Data Layer.
- The U.S. Geological Survey National Land Use and Land Cover dataset.
- The Nature Conservancy Conservation and Recreation Lands database.
- The Michigan Natural Features Inventory bio-uniqueness dataset.
- The National Wetlands Inventory GIS data layers.
- Various spatial data from the Michigan Geographic Data Library.

This project will build upon the existing Wind Prospecting Tool. The LPI has been working extensively with local, state and federal agencies to gather a 30-year database that includes both statistical and spatial data to enable research and decision making. Specific examples include 1980, 1990 and 2000 U.S. Census Bureau population and housing data from the statewide scale down to the block group, U.S. Department of Commerce data for the entire country that details jobs, income and earnings at the county level over 30 years, and Michigan State Tax Commission data that details the number, type and value of every parcel of land in Michigan at the township level. This data is integrated with governmental boundary mapping data as well as imagery, land use and land cover data, outputs from the Land Transformation Model and other spatial data.

Estimated Budget

Comment [MD3]: Not yet detailed. In progress

Total Amount Requested	Total non-Federal Match
\$140,000	\$70,000

CURRICULUM VITAE

The vitae of the eight Team members are attached.

Soji Adelaja, Ph. D.

3870 Hemmingway Drive, Okemos, MI 48864

Phone: (517) 706-0703, Fax: (517) 706-0702, Mobile: (517) 230-0728

Email: Adelaja@msu.edu

EDUCATION

- Ph.D., Economics**, 1985, College of Business, West Virginia University, Morgantown, WV.
- M.A., Economics**, 1981, College of Business, West Virginia University, Morgantown, WV.
- M.S., Agricultural Econ.**, 1980, College of Agriculture, W. Virginia Univ., Morgantown, WV.
- B.S., Agricultural Mechanization**, 1978, College of Agriculture, Penn. State University, Park, PA.

SELECTED PROFESSIONAL EXPERIENCE

- Jan. 2004-present: John A. Hannah Distinguished Professor in Land Policy; Director of the Land Policy Program; Professor in the Departments of Agricultural Economics; Geography; and Community, Agricultural and Recreational Resource Studies; Michigan State University.
- June 2002-Aug. 2003: Executive Dean of Agriculture & Natural Resources; Dean of Cook College; Executive Director of the New Jersey Agricultural Experiment Station; Director of Rutgers Cooperative Extension; Rutgers University.
- Oct. 1999-May 2002: Dean/Director of Research, Cook College/NJ Agricultural Experiment Station, Rutgers University.
- July 1999-Sept. 2002: Founding Director, Food Policy Institute (FPI), Rutgers University.
- July 2000-March 2001: Founding Director, Food Innovation Research Extension Center (FIRE), Rutgers University.
- July 1999-Jan. 2004: Professor, Dept. of Agricultural, Food & Resource Econ., Rutgers Univ.
- July 1996-Oct. 1999: Chair, Dept. of Agricultural, Food & Resource Econ., Rutgers Univ.
- July 1995-July 1996: Senior Policy Advisor to Secretary of Agriculture, NJ Dept. of Agric.
- July 1994-Oct. 1998: Associate Director, Ecopolicy Center, Cook College, Rutgers Univ.
- July 1993-July 1994: Founding Director, Ecopolicy Center, Cook College, Rutgers University.
- July 1992-June 1999: Associate Professor, Dept. of Agric. Econ. & Marketing, Rutgers Univ.

SELECTED ACCOMPLISHMENTS

- Scholarly Expertise:** Public Policy; Land Use; Renewable Energy; Agriculture Policy at the Urban Fringe; Food Industry Development; Resource Management Policy; Market Based Regulations in Fisheries; and Government/Industry Partnerships.
- Fundraising:** Approximately \$10 million in research, teaching and outreach grants and \$30 million in gifts and endowments. Provided leadership to others in raising over \$30 million.
- State Government:** Service on various state boards, commissions & task forces, and policy adviser to state government.
- Policy Leadership:** Provided leadership for numerous state policy initiatives (research was basis for many state policies).

SELECTED RECENT PUBLICATIONS/PRESENTATIONS

State Conferences

- A. Adelaja, J. Warbach, C. McKeown, et al. "Renewable Energy and the LPI Wind Energy Policy Initiative." Michigan Agricultural Experiment Station Meeting, Kellogg Conference Center. October 23, 2007.
- A. Adelaja, C. McKeown, et al. "Wind Power, Feasibility and Possible Locations in Michigan." Presented at the Bio Economy Summit. Lansing Center. Lansing, MI. September 12, 2007.
- A. Adelaja, C. McKeown, et. at. "Wind Power, Feasibility and Possible Locations in Michigan." Presentation at the Land Policy Institute Wind Prospecting Tool Symposium, Kellogg Conference Center, September 10, 2007.
- A. Adelaja, C. McKeown, et. at. "Michigan Wind Prospecting Tool." Presentation, Town Hall Meeting at the Great Lakes Energy Fair, Onkama Fairgrounds. June 23, 2007.
- A. Adelaja, C. McKeown, et. at. "Michigan Wind Prospecting Tool." Presentation, Michigan Wind Manufacturing Group, Crystal Mountain. June 22, 2007.

Major State Government Policy Reports

- A. Adelaja and Y. G. Hailu. "Projected Impacts of Renewable Portfolio Standards on Wind Industry Development in Michigan." White paper prepared for the Office of the Governor, State of Michigan. Land Policy Institute, Michigan State University. December 12, 2007.
- A. Adelaja, Y. G. Hailu, et al. "Wind Turbines Required to Meet Michigan's 2015 Renewable Portfolio Standards (RPS) Goal." Land Policy Institute (Michigan State University) – Fact Sheet. December 13, 2007.
- A. Adelaja and Y. G. Hailu. "Econometric Analysis of the Determinants of State's Wind Capacity Installation." Land Policy Institute (Michigan State University) – Fact Sheet. October 28, 2007.
- A. Adelaja, Y. G. Hailu, et al. "What Everyone Needs to Know about the Renewable Portfolio Standard." Land Policy Institute (Michigan State University) – Fact Sheet. October 15, 2007.

YOHANNES G. HAILU

Visiting Assistant Professor
Associate Director of the Hannah Professor Research Program
Land Policy Institute, Michigan State University
305 Manly Miles Building, East Lansing, MI 48823
(517) 432 8800 ext 112
yhailu@landpolicy.msu.edu

EDUCATION

- Ph.D. (Natural Resource Economics): West Virginia University, May 2006.
- M.Sc. (Agricultural & Resource Economics): West Virginia University, December 2002.
- B.A. (Economics and Finance): University of Asmara, Eritrea, September 2000.

WORK EXPERIENCE

- Visiting Assistant Professor and Associate Director of the Hannah Professor Research Program: Land Policy Institute, Michigan State University, (East Lansing, MI) – November 2007 to Present.
- Visiting Assistant Professor and Research Coordinator: Land Policy Institute, Michigan State University, (East Lansing, MI) – February 2007 to October 2007.
- Assistant Professor of Economics: West Liberty State College, (West Liberty, WV) – August 2005 to December 2006.

SELECTED PUBLISHED ARTICLES AND REPORTS

- Yohannes G. Hailu, Tesfa G. Gebremedhin and Randall Jackson. 2008. "A Regional Economics Analysis of the Links between Income Inequality and Economic Growth." In print - *Journal of Income Distribution*.
- Yohannes G. Hailu and Cheryl Brown. 2007. "Regional Growth Impacts on Agricultural Land Development: A Spatial Model for Three States." *Agricultural and Resource Economics Review*, 36/1, pp 149-163.
- Soji Adelaja and Yohannes G. Hailu. (December 12, 2007). "Projected Impacts of Renewable Portfolio Standards on Wind Energy Development in Michigan." Policy paper prepared for the Office of the Governor, State of Michigan. Land Policy Institute, Michigan State University.

- Soji Adelaja, Yohannes G. Hailu, et al. (December 13, 2007). "Wind Turbines Required to Meet Michigan's 2015 Renewable Portfolio Standards (RPS) Goal." Land Policy Institute (Michigan State University) – Fact Sheet.
- Soji Adelaja and Yohannes G. Hailu. (October 28, 2007). "Econometric Analysis of the Determinants of States' Wind Capacity Installation." Land Policy Institute (Michigan State University) – Fact Sheet.
- Soji Adelaja, Yohannes G. Hailu, et al. (October 15, 2007). "What Everyone Needs to Know about the Renewable Portfolio Standard." Land Policy Institute (Michigan State University) – Fact Sheet.
- Yohannes G. Hailu and Randall S. Rosenberger. 2004. "Modeling Migration Effects on Agricultural Lands: A Growth Equilibrium Model." *Agricultural and Resource Economics Review*, 33/1, pp 50 – 60.

AWARDS AND HONORS

- First Tories Memorial Best Ph.D. Research Award, Division of Resource Management, West Virginia University (2005).
- Best Master's Thesis Award, Department of Agricultural and Resource Economics, West Virginia University (2003).
- Conference Invited Paper Award, Northeast Agricultural and Resource Economics Association (2003).

PROFESSIONAL SERVICE

- Consultant in a project on the Environmental Justice Implications of Transportation Systems in Baltimore, 2008.
- Consultant to United Nations Environmental Program – assessment of cross-sectoral impacts on biodiversity, Montreal, Canada, 2006 – 2007.
- Consultant to Department of Agriculture – land use policy matters, Pretoria, South Africa, 2005-2006.

PROFESSIONAL AFFILIATIONS

- American Agricultural Economics Association
- Northeastern Agricultural and Resource Economics Association
- Southern Agricultural Economics Association
- Gamma Sigma Delta, the National Honor Society of Agriculture and Forestry

Dr. Mary Ann Heidemann
 136 S. First Street, Rogers City MI 49779
 989-354-9870 heidema9@msu.edu

Education

PhD, 1989, Land Resources, Institute for Environmental Studies, University of Wisconsin - Madison.
 MA, 1985, Public Policy and Administration, La Follette Institute, University of Wisconsin - Madison.
 Fellow, 1978, National Endowment for Humanities, Federalism Seminar, Univ. of California, San Diego.
 Masters Coursework, 1972-75, Landscape Arch. and Regional Planning, Univ. of PA, Philadelphia.
 BA, 1970, Art, Reed College, Portland, Oregon. Thesis in Architectural History.

Certifications, Licenses and Memberships

Member, American Institute of Certified Planners and American Planning Association
 Registered Professional Community Planner, State of Michigan
 Licensed Residential Builder, State of Michigan
 Michigan Economic Developers Association – Practitioners Training Certificate Program, 2001
 Teaching Staff – Michigan State University Extension (MSUE) Citizen Planner Program
 County Commissioner, Presque Isle County 1990-1992
 Adjunct Professor, Lake Superior State University, 1989-1995

<u>Employment History</u>	<u>Dates</u>	<u>Position</u>
Michigan State University Extension		
Alpena, Alpena County MI	7/07 – current	Regional Land Use Educator
Standish, Arenac County MI	3/05 – 6/07	Arenac County Extension Director
Rogers City, Presque Isle County MI	3/00 – 2/05	Community & Economic Development Agent
Wade-Trim, Incorporated Indian River, Michigan	8-97 – 2/00	Vice-President of 400-person engineering, survey and planning consulting firm
Mary Ann Heidemann & Associates Rogers City and Boyne City, Michigan	7/88 – 8/97	Owner and Principal Planner of six-person planning consulting firm
Wade-Trim IMPACT Taylor, Michigan	9/87 – 6/88	Project Manager for community planning zoning and environmental projects
East MI Environmental Action Council Birmingham, Michigan	6/86 – 9/87	Executive Director for non-profit environmental advocacy group
WI Department of Transportation Madison, Wisconsin	3/85 – 6/86	Chief of Environmental Operations and Development Section
WI Department of Natural Resources Madison, Wisconsin	11/81 – 2/85	Hazardous waste planner; sewage plant construction grant officer

U.S. EPA Region V Analytic Center Chicago, Illinois	4/80 – 5/81	Program Analyst: evaluation of pollution control permit programs
Champ, Parrish, Raasch DePere, Wisconsin	10/78 – 2/80	Planner for engineering/architecture firm site plans, land use, utilities, permits
Brown County Planning Commission Green Bay, Wisconsin	6/76 – 6/78	Natural Resource Planner: air, water and sewer studies; natural features
Kansas State University Manhattan, Kansas	8/75 – 5/76	Assistant Professor of Landscape Architecture and Regional Planning
Jack McCormick & Associates Devon, Pennsylvania	2/72 – 8/74	Project Manager and Cartographer for environmental consulting firm

John Hummer

Great Lakes Commission, Ann Arbor, MI Ph: 734-971-9135 Email: jhummer@glc.org

Education

1990–1992 Michigan State University E. Lansing, MI

- M.S., Resource Development
- Dual emphasis: Natural Resources Policy and Planning; Community and Regional Development

1980–1984 Central Michigan University Mt. Pleasant, MI

B.A.A., Broadcast and Cinematic Arts; Marketing minor

Experience

March 2001–Present Great Lakes Commission Ann Arbor, MI

Project Manager, Environmental Quality

- Facilitate regional initiatives
 - Great Lakes Wind Collaborative
 - Great Lakes Coastal Wetlands Consortium
 - Lake Michigan Monitoring Coordination Council
- Manage and monitor project budgets
- Manage small grants program for river, stream and creek cleanups
- Facilitate project development and grant writing
- Provide technical support, outreach and communications services

- Coordinate conferences, workshops and other special events

January–March 2001 Up North Publications Bellaire, MI

News Writer

- Conducted news research and collection of story material
- Wrote and edited news stories for publication in local newspaper

1994–2000 MSU Extension/Antrim Co. Bellaire, MI

Friends of the Jordan River

Director

- Coordinated watershed protection and advocacy efforts
 - Developed grant proposals and sought funding for specific projects
 - Led membership recruitment and development
 - Developed informational, outreach and educational programs & materials
 - Handled accounting, reporting and day-to-day financial matters
- **Awards and Honors** 1999 – Clean Waters Award, Michigan Outdoor Writers Association
 - 1997 – Environmentalist of the Year, N. MI Environmental Action Council

Reports and Publications

- *Great Lakes Coastal Wetlands Monitoring Plan.* Great Lakes Coastal Wetlands Consortium, 2008 (a project of the Great Lakes Commission).
- *Lake Michigan Pilot Study of the National Monitoring Network for U.S. Coastal Waters and Their Tributaries.* Lake Michigan Monitoring Coordination Council, 2008 (a project of the Great Lakes Commission).
- *AIS Early Detection and Monitoring: A Pilot Project for the Lake Michigan Basin – Guidelines and Recommendations.* Great Lakes Commission, 2006.
- *Proceedings – Michigan Fish Contaminant Trend Monitoring Strategy: Peer Review Workshop.* Great Lakes Commission, 2003.
- *Proceedings – The Latest and Greatest for the Great Lakes: Innovations in Assessment Monitoring and Restoration of Beneficial Uses in the Great Lakes Areas of Concern.* Great Lakes Commission, 2002.
- *An Overview of U.S. Great Lakes Areas of Concern.* Great Lakes Commission, 2002.

Professional Affiliations

- Association of State Wetland Managers – member
- National Water Quality Monitoring Council – member
- Washtenaw Land Trust – member, Land Protection Committee

Charles McKeown

(517) 812-4909

764 Beverly Park Place. Jackson MI 49203

mckeownc@msu.edu

Education:

- Master of Science in Entomology with a certified specialization in Ecology, Evolutionary Biology and Behavior, Michigan State University, 2003
- Bachelor of Science with Honors Entomology, Michigan State University, 2001
- Associates Degree with Honors Jackson Community College, 1998

Professional Experience:

- Currently Manager of Land Use Informatics, Michigan State University, Land Policy Institute
- Land Use/GIS Educator Michigan State University Extension, Hillsdale County
- Research Associate at the Computational Ecology and Visualization Laboratory at Michigan State University
- Teaching Assistant for Introduction to Environmental Science, Michigan State University, winter semester 2000, fall and winter 2000-2001
- Teaching assistant for Canadian Rockies Study Abroad Program, Summer 2000
- Self-Employed, Custom Electronics Design, December 1997 to August 2000
- United States Marine Corps, October 1993 to October 1997. Honorably discharged as a Sergeant

Experience:

Research:

- Built and packaged a multi-scale multi-timeframe land use, demographic, and spatial database for research
- Experienced in System Science integrative modeling and complex dynamic modeling.
- Performed impact analysis using land projections
- Built and deployed an enterprise level GIS in Hillsdale County Michigan
- Trained GIS users at the beginning and advanced levels in ESRI products ranging from ARC 3.X to ARC 9.1
- Proficient in geodatabase construction, deployment, and metadata documentation
- Proficient in ARC IMS implementation and web mapping
- Practiced at using GIS as a public communication tool
- Applied Arc GIS software to landscape level analysis
- Directed field lab and three field technicians
- Designed and implemented an arthropod community level sampling regime
- Proficient in experimental design, spatial, and statistical analysis
- Well versed in the application of ecological theory and experimental techniques

Publications and Presentations:

- McKeown C. Colunga G. Gage S. (2000). "Temporal Niche Separation in Two Exotic Coccinellids." A poster presented to the Land Use and Land Cover Forum (Michigan State University) December 2000.

- McKeown C. (2001). "Arthropod community monitoring and Landscape Spatial Analysis." A talk given to the National Science Foundation review board, (Kellogg Biological Station, Hickory Corners Michigan) May 2001.
- McKeown C. Et al. (2001). "Microhabitat Preference of the Dominant Members of the Coccinellid Community in an Agricultural Landscape." A poster presented to the Entomological Society of America regional meeting (Michigan State University) November 2001.
- McKeown C. et al (2002). "Response of the Coccinellid Community to the Presence of the Soybean Aphid (*Aphis glycines*)." A poster presented at the national meeting of the Entomological Society of America (Fort Lauderdale, Florida). November 2002.
- McKeown C. (2003) "Flow of Predatory Coccinellids in Row Crop Ecosystems." A Presentation given to the L.T.E.R. Executive Committee (Kellogg Biological Station, Hickory Corners Michigan) May 2003.
- McKeown C. (2003) "Quantifying the Roles of Competition and Niche Separation in Native and Exotic Coccinellids, and the Changes in the Community in Response to an Exotic Prey Species" A THESIS Submitted to Michigan State University.
- McKeown C. Et Al(2003). "*Harmonia axyridis*, a 14 Year Summary and Spatial Analysis" A talk given at The Entomology Society of America National Meeting (Cincinnati Ohio), October 2003.
- McKeown C. (2004) "GIS for planning and Information" A workshop developed to allow local officials to understand and access GIS information for decision making support, Presented in Hillsdale County Quarterly
- McKeown C. (2005) "Land Use Issues in Hillsdale County" a six part seminar series, developed in cooperation with five local agencies, aimed at producing a rational dialogue on land use in Hillsdale County, MI.
- McKeown C. (2005) "Picture Michigan Tomorrow examines the impact of land use change on Michigan's Natural Features" Land Policy Institute Technical Bulletin 2005-1.
- McKeown C. (2005) "Picture Michigan Tomorrow examines the impact of land use change on Michigan's Agricultural Economy" Land Policy Institute Technical Bulletin 2005-2.
- McKeown C. (2006) "GIS for planning and information: digital decision support" a Citizen Planner Module presented most recently in Washtenaw County.
- McKeown C. (2006) "Using GPS and SIM-City technology to save our planet" a Junior Citizen Planner module and 4H Exploration Days class taught most recently at 2006 Exploration Days.
- McKeown C. (2006) "Picture Michigan Tomorrow, MSU's Role in Scenario Planning" a presentation given to the Traverse City Transportation and Land Use Study stakeholders.
- McKeown C. (2006) "Green Schools, Healthy Learning, Healthy Communities" a presentation given to the Jackson Public Schools stakeholders and Superintendent.
- McKeown C. (2006) "Demographic Trends and their effects on Land Use in Michigan" Land Policy Institute Technical Bulletin 2006-1.
- McKeown C. (2006) "Projecting the Impacts of Michigan's Future Housing Demand" Land Policy Institute Technical Bulletin 2007.
- McKeown C Et al (2007) "The land Policy Institute Wind Prospecting Tool" Presentation given to State Wind Conference Meeting.
- McKeown C Et al (2007) "The land Policy Institute Wind Prospecting Tool" Presentation given to State Wind Conference Meeting.
- McKeown C. et al (2007) "The land Policy Institute Wind Prospecting Tool" Land Policy Institute Technical Bulletin 2007

- Adelaja, Soji, Yohannes Hailu, John Warbach, Michael Klepinger, Charles McKeown, Benjamin Calnin and Max Fulkerson. "What Everyone Needs to Know About RPS" Land Policy Institute Technical Bulletin. 2007
- Adelaja, Soji, Yohannes Hailu, John Warbach, Michael Klepinger, Charles McKeown, Benjamin Calnin and Max Fulkerson. "Wind Turbines Required to Meet Michigan's Renewable Portfolio Standard Goal" Land Policy Institute Technical Bulletin 2007
- Adelaja. Et al (2008) "Econometric Analysis of the Determinants of State's Wind Capacity Installment" Land Policy Institute Technical Bulletin 2008
- Adelaja. Et al (2008) "Bring Manufacturing Into Focus, Opportunities for Bio economy Industry Development in the Tri County Area" Land Policy Institute Technical Bulletin 2008

VICTORIA PEBBLES
 495 N. Wagner Road
 Ann Arbor, Michigan 48103
 734-669-2466
vpebbles@glc.org

EMPLOYMENT

- ◆ **Great Lakes Commission, 1993 – Present.** Program Manager for Transportation and Sustainable Development;
 - *responsibilities:* program development; project management; regional coordination (8 states, two provinces, 2 federal governments, non-profit organizations, academic institutions, and other Great Lakes stakeholders); outreach (to stakeholders); advocacy (to Congress)
 - *expertise:* Great Lakes institutions and policy; sustainable development; brownfields redevelopment; urban revitalization; land use; habitat protection; coastal zone management; ecological indicator development and reporting; dredging and dredged material management
- ◆ **University of Michigan, Educational Design Team, 1991-1993.** Developed educational and training materials for owners and operators subject to regulations under the federal Resource Conservation and Recovery Act.
- ◆ **U.S. Senate, 1990-1991. John A. Knauss National Marine Policy Fellow ("Sea Grant" Fellow).** Drafted and tracked legislation related to environmentally-friendly product labeling ("green labeling"); beach water quality; & Clean Air Act Amendments, among others; staff support to subcommittee of Committee on Environment and Public Works.
- ◆ **U.S. Environmental Protection Agency Region 9, 1989. National Network for Environmental Management Fellow.** Examined and developed recommendations regarding state-federal institutional relations among agencies with environmental management and protection authorities and responsibilities.
- ◆ **Coastal States Organization, 1987-1988.** Assisted with research and advocacy for national network of state interests to secure federal support for the Coastal Zone Management Act and other national environmental policies impacting coastal states.
- ◆ **U.S. Senate, 1986-1987.** Office of Senator Alan Cranston
- ◆ **U.S. Congress: Environmental and Energy Study Conference, 1986**

RELATED PROFESSIONAL ACTIVITIES

- ◆ **Sustainable Futures Institute Advisory Board, Michigan Technological University, 2006 – Present**

- ◆ Great Lakes Water Quality Agreement Review Special Issues Working Group, 2006-2007
- ◆ Great Lakes Regional Collaboration Sustainable Development Strategy Team Member; Land Use and Development Workgroup Co-Chair, 2005.
- ◆ International Joint Commission (IJC) Science Advisory Board, Working Group on Parties Implementation, 2002-2005
- ◆ City of Ann Arbor Greenbelt Commission, 2004-2005
- ◆ State of the Lakes Ecosystem Conference Steering Committee, 1998-Present

PROFESSIONAL SKILLS & CAPABILITIES

- ◆ Program development: project management; grants management; budget development; personnel management; fundraising
- ◆ Regional coordination; coalition and consensus building: establishment and management of multi-stakeholder task forces, advisory groups and project teams; project tracking and reporting; product delivery
- ◆ Research, writing, editing
- ◆ Issue and policy analysis

EDUCATION

- ◆ M.S., University of Michigan, 1991. Natural Resource Policy and Behavior.
- ◆ B.A. with Honors, University of California, Santa Cruz, 1986. Environmental Studies.

SELECTED ARTICLES, REPORTS AND TECHNICAL PUBLICATIONS

- ◆ Pebbles, V., B. Pearson and T. LaSalle. 2008. *Local Investment in the Great Lakes and St. Lawrence*. Great Lakes Commission, Ann Arbor, Michigan.
- ◆ Sterrett-Isely, E. and V. Pebbles. 2008. *Great Lakes Submerged Lands Policy and Management: A Comparative Analysis of Eight States' Coastal and Submerged Lands Laws, Regulations, and Policies*. Manuscript pending publication; submitted to *Coastal Management*, January, 2008.
- ◆ Lake St. Clair Coastal Habitat Assessment Project Management Team, V. Pebbles and T. Rayburn. 2006. *Lake St. Clair Coastal Habitat Assessment: with recommendations for conservation and restoration planning*. Great Lakes Commission, Ann Arbor, Michigan.
- ◆ Pebbles, V. and L. Kaminski. 2004. *Measuring Change Toward Balanced Growth*. Great Lakes Commission. Ann Arbor, Michigan.
- ◆ Beneficial Use Upland Testing and Evaluation Project Management Team, J. Dettling and V. Pebbles. 2004. *Testing and Evaluating Dredged Material for Upland Beneficial Uses: A Regional Framework for the Great Lakes*. Great Lakes Commission, Ann Arbor, Michigan.
- ◆ Mac Donagh-Dumler, J., V. Pebbles and J. Gannon. 2003. *North American Great Lakes Experience: Management Issues and Challenges*. Presented at the International Lake Environment Committee/LakeNet Regional Workshop for Europe, Central Asia and the Americas. http://www.worldlakes.org/uploads/Great_Lakes_24Dec03.pdf
- ◆ Hildebrand, L.P., V. Pebbles and D.A. Fraser. 2002. *Cooperative Ecosystem Management Across the Canada - U.S. Border: Approaches and Experiences of Transboundary Programs in the Gulf of Maine, Great Lakes and Georgia Basin/Puget Sound*. *Ocean and Coastal Management* Vol. 45: 421-457.
- ◆ Pebbles, V. 2001. *Linking Brownfields Redevelopment and Greenfields Protection for Sustainable Development*. Great Lakes Commission. Ann Arbor, MI.
- ◆ Thorp, S., V. Pebbles and R. Rivers. 1997. *Impacts of Changing Land Use*. State of the Lakes Ecosystem Conference Background Paper. EPA doc. 905-R-97-015d, ISBN # 0-662-26034-1. Chicago, Illinois and Burlington, Ontario

Kurt H. Schindler

12553 Cedar Creek Road October 24, 2007
Wellston, Michigan 49689-9731
(616)723-4784

Work Experience:

Regional Land Use Educator, Michigan State University Extension, north west Lower Peninsula of Michigan with an expertise in Land Use, Groundwater, Leadership facilitation. July 1, 2007 to present. Co-Chair Land Use Area of Expertise team, continued leadership role in *Citizen Planner* training program; training program on the 2007-8 Michigan Planning Enabling Act; author of various *Land Use Series* bulletins, author of training programs/lectures on planning, zoning, and land use; developed a personal web page on Michigan planning and zoning, originator of e-mail newsletter on planning and zoning court cases, legislation and training.

County Extension Director, Michigan State University Extension, Wexford County; with an Area of Expertise in Land Use, Groundwater, Leadership facilitation. March 29, 1999 to June 30, 2007: Member of Land Use Area of Expertise team, role in development of the *Citizen Planner* training program; training program on the 2001/2002 amendments to the state's zoning and planning enabling statutes, training on the Michigan Zoning Enabling Act; and other land use activities. Also instrumental in the Cadillac area Clam River Greenway trail development, providing cultural diversity training to Wexford County, Master Gardener, Cadillac Wellhead Protection, Eurasian Milfoil Committee for Lake Cadillac, and more.

Director of Planning, Manistee County Planning Department, employed by the Manistee County Planning Commission, October 13, 1978 to March 26, 1999: Economic development, successful Michigan Renaissance Zone (tax-free economic development area) applicant; land use mapping and planning; resource inventory mapping, operation and management of a Geographic Information System (G.I.S.); solid waste management and planning; technical assistance to municipalities in zoning and other ordinance writing, zoning administration, community planning, land use planning, grantsmanship; recreation planning; plan for and oversaw construction of new jail and sheriff's department; transportation planning; administration of a county wide house numbering (address) system; soil erosion administration; computer skills; staff recommendations for planning reviews, capital improvement planning, open space and farmland preservation application reviews, administration of a county subdivision control ordinance; public relations; office administration, budget.

Self Employed off and on from August 1986 to December 1999 as consulting planner.

Reporter, photographer; Manistee News-Advocate, June 1976–October 13, 1978; summer 1995.

Various capacities; The Answer Place (information, rumor control, MSU, academic years 1974-6.

Librarian and Archivist; Manistee County Historical Museum, Summer 1973 and 1974.

Education:

- 1999-2006, continuing education (MSU Extension in-service) in management, land use, leadership, adult education, GIS.
- May 2002, Learning from Land Use Change Models Conference in Ohio
- August 2003, Watershed Conference
- May 2004, New Generation Resource Policy For A Region in Transition: Land Use, Agriculture, Environment, and Health in the Great Lakes Region
- August 2000, ArcView™ Geographic Information System (GIS) software training
- August 1993, continuing education "Jurisdictional Delineation of Wetlands in Michigan".
- August 1991, continuing education at MSU's Center for Remote Sensing in C-Map G.I.S. computer software.
- March 1990, completed Michigan Department of Natural Resources Soil Erosion Certification.
- Fall 1986, continuing education at West Shore Community College in BASIC computer programing. (Also self taught: WordPerfect; dBASE III Plus; Lotus 1-2-3; Design CAD 2d; computer communications networking.)
- June 1976 graduate with high honors from Michigan State University, BA degree from College of Communication Arts, School of Journalism: 39 credits total.
- Extensive study in MSU's College of Social Science, Department of Geography: 34 credits total, with special interest in cartography; special areas of study in Geography: Michigan's physical geography; recreation; vacation patterns; public lands; economic geography; rural land uses; transportation; city spatial arrangement; internal city pressures; drawing maps and air photo interpretation; studies overseas London, England.
- June 1972 graduate with honors from Cass Technical High School ,degree in Graphic Arts.

Organizational Activities:

- Advisory Board member for Partnerships for Change;
- City of Cadillac's Cool Cities advisory committee;
- City of Cadillac Wellhead Protection Program Committee;
- Clam River Greenway Committee;
- Cadillac Area Rotary Club;
- Norman Planning Commission., Chair;
- Pine River (State Natural Rivers) Zoning Review Board, Member and Chair, January 2005 to present.
- Member of Improving Michigan Access to Geographic Information Network (IMAGIN) board of directors, 1993-2000;
- Senator Vernon J. Ehlers' G.I.S. Legislation Advisory Committee, May 1992-1993;
- Michigan Society of Planning board of directors, 1987-1993 (president 1991-1992 (former treasurer/secretary, vice president, now a member of their Education Committee);
- Michigan DNR Ad Hoc Committee on the Great Lakes Shorelands High Risk Erosion Area Rules (Feb.-June 1991);
- Points Betsie to Sable Conservancy, Inc. (founder, Treasurer) 1990-1994);
- Michigan Department of Commerce Task Force on Subdivision Control Act;
- Inventory Advisory Committee to the Natural Resources Commission (a Governor appointment) Aug. 1985-1993;
- Betsie River Wild and Scenic River Review Board (co-chair) January 1979-1999;
- Northwest Michigan Council of Government's Planners Review and Advisory Committee (Vice Chairman, Chairman) October 1978-1999, presently on their Education Committee).

Publications: in Michigan state-wide and national publications on planning topics, open meetings act; "Lessons from New Zealand's Land-Use Laws"; "Planning and Development Regulation in New Zealand Contrasted to Michigan"; "Regulation of Oil & Gas Activities in Michigan"; "Organizing for Planning and Economic Development"; "Model Zoning Administrator Office Manual"; "Site Plan Review for Groundwater Protection"; "How Governments Make Submissions on a Neighbor's or County's Proposed Plan"; "Planning Under Michigan Planning Enabling Acts: The Wexford County Example;" and several Extension bulletins.

Other interests: photography; ornithology; books; printing; seamanship; genealogical research; cross country ski; forest management; Master Gardener.

VITA: JOHN D. WARBACH, PH.D.

310 Manly Miles Building
1405 S. Harrison Road, Michigan State University, East Lansing, MI 48823

EDUCATION:

- Ph.D. in Urban Forestry, from Michigan State University in 1989
- Master of Landscape Architecture, Site Design, from University of California-Berkeley, 1974
- Bachelor of Science in Landscape Architecture from Michigan State University in 1969

PROFESSIONAL EXPERIENCE:

- **Professor**, February 1, 2007 to present. **Associate Director, Research and Faculty Development**, Land Policy Institute, Michigan State University.
- **Professor**, February 1, 2006 to January 31, 2007. **Associate Director**, Planning and Zoning Center at Michigan State University. **Assistant Director**, Land Policy Institute, Michigan State University
- **Principal**, September 1993 to January 31, 2006. Planning & Zoning Center, Inc. Lansing, Michigan.
- **Research Associate & Project Manager**, May 1990 to September 1993. Planning and Zoning Center, Inc. Lansing, Michigan.
- **Research Assistant**, September 1989 to April 1990. Planning and Zoning Center, Inc. Lansing, Michigan.
- **Instructor**, 1986-1990 while pursuing Ph.D. Michigan State University. School of Urban Planning and Landscape Architecture, Department of Horticulture. East Lansing, Michigan
- **Assistant Professor**, 1979-1985, Michigan State University. School of Urban Planning & Landscape Architecture. East Lansing, Michigan
- **Assistant Professor**, 1973-1979. State University of New York-Syracuse. School of Landscape Architecture, College of Environmental Science & Forestry, Syracuse, New York.
- **Landscape Engineer**, 1969 to 1971. Michigan State University. Division of Campus Park & Planning. East Lansing, Michigan.
- **Landscape Architect Assistant**, Summer 1969. Bodfan Gruffydd & Associates. London, England.

PROFESSIONAL SERVICE, EXPERIENCE AND PUBLICATIONS:

- Michigan State Wind Outreach Team
- North American Lake Management Society, Michigan Chapter
- Go Green Go Lansing Committee Member

- Lake Lansing Watershed Management Assessment District Advisory Committee, 1999-2005
- Co-instructor with Dr. Soji Adelaja, the John A. Hannah Distinguished Professor in Land Policy of the new Michigan State University course: "ESA 450: Smart Growth and Strategic Land Use Decision Making," through the Department of Community, Agriculture, Recreation Resources Studies.
- Presenter at annual, regional and local meetings of the Michigan Lake and Streams Association, land conservancies, Michigan State University Agriculture and Natural Resources Week, Michigan State University academic courses in the Department of Park, Recreation and Tourism Resources, Michigan Chapter American Water Resources Association, Michigan Chapter North American Lake Management Society, Michigan Chapter American Planning Association, Michigan Chapter American Society of Landscape Architects and others.
- **Smart Growth Readiness Assessment Tool.** This project developed an online tool for Michigan communities to use to determine how suited their community plans and regulations are to implementing ten Smart Growth tenets. The tool uses a series of questions communities can use to score themselves, and provides additional resources or links to resources, plus 50 Michigan success stories.
- **Tri-Communities Comprehensive Plan.** Funded in part by the Coastal Zone Management Program, Michigan Department of Environmental Quality (under NOAA program), this was a comprehensive plan update of three coastal communities: Saugatuck City, Saugatuck Township and the Village of Douglas.
- Ardizzone, Kate, Mark Wyckoff and John Warbach. **Filling the Gaps: Environmental Protection Options for Local Governments.** MDEQ, 2003.
- Warbach, John D. and Edward Mahoney **Upper Great Lakes Basin Plan of Study.** US Army Corps of Engineers. 2003.
- Warbach, John D. and Edward Mahoney. **Economic Impacts of Lake Michigan Levels on Recreational Boating.** US Army Corps of Engineers. 2002.
- Warbach, John D., Mark Wyckoff, Gerald A. Fisher. **Regulating Keyhole Development: Carrying Capacity Analysis & Ordinances Providing Lake Access Regulations.** November 1994, 56 pages.
- Wyckoff, Mark, Editor, John Warbach and Kristine Williams. **Protecting Inland Lakes: A Watershed Management Guidebook.** Clinton River Watershed Council and Michigan Department of Natural Resources, February 1990. 170 pages.
- Adelaja, Soji, Yohannes Hailu, John Warbach, Michael Klepinger, Charles McKeown, Benjamin Calnin and Max Fulkerson. "What Everyone Needs to Know About RPS" Land Policy Institute Technical Bulletin. 2007
- Adelaja, Soji, Yohannes Hailu, John Warbach, Michael Klepinger, Charles McKeown, Benjamin Calnin and Max Fulkerson. "Wind Turbines Required to Meet Michigan's Renewable Portfolio Standard Goal" Land Policy Institute Technical Bulletin 2007
- Warbach, John D. **Lee County Site Suitability Analysis.** Florida Boating Access Inventory and Economic Study, Florida Fish and Wildlife Conservation Commission. April 2007. Internal study, unpublished.
- Forsyth, Mike, John Warbach and Mark Wyckoff. **Smart Growth Readiness Assessment Facilitation Manual.** Land Policy Institute, Michigan State University. February, 2007.
- Warbach, John D. **Bringing America Back in Sync with its Values: Designing Healthy Livable Communities Conference.** *Planning & Zoning News.* 23 (3) 2005.
- Warbach, John D. **Perceptions of Nature and Open Space in Hamburg Township and Southeast Michigan.** *Planning & Zoning News.* 22 (12) 2004.
- Warbach, John D. and Sarah Nicholls. **Overcoming Impediments to Smart Growth.** *Planning & Zoning News.* 22 (11) 2004.

- Warbach, John D. *An Introduction to Green Development*. **Planning & Zoning News**. 22 (9) 2004.
- Warbach, John D. *Green Development Implications for Community Planning*. **Planning & Zoning News**. 22 (9) 2004.
- Warbach, John D. *Basic Principle of Green Development—The Living Ecosystem Model*. **Planning & Zoning News**. 22 (9) 2004.
- Warbach, John D. *Michigan Residents Views on Development and Land Use*. **Planning & Zoning News**. 22 (3) 2004.

REFERENCES CITED

Klepinger, M, Extension Specialist, "Wind Power in Michigan Land Use and Policy Issues" Citizen Planner PowerPoint Presentation. LPI Michigan State University.